# National Recovery Plan for Adamson's Blown-grass *Lachnagrostis adamsonii*

**Anna Murphy**

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Prepared by Anna Murphy, Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment, Heidelberg

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This Recovery Plan has been developed with the involvement and cooperation of a range of stakeholders, but individual stakeholders have not necessarily committed to undertaking specific actions. The attainment of objectives and the provision of funds may be subject to budgetary and other constraints affecting the parties involved. Proposed actions may be subject to modification over the life of the plan due to changes in knowledge.



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**Cover photograph:** *Lachnagrostis adamsonii* growing in a saline drainage line surrounded by recently established trees. Altered hydrology as a result of revegetation works and plantations currently threatens many *L. adamsonii* populations. Photo by Ruth Raleigh

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## Summary

Adamson's Blown-grass *(Lachnagrostis adamsonii)* is a tufted, short-lived perennial grass endemic to south-western Victoria, where it grows adjacent to saline wetlands and watercourses. The species was known from about 70 locations, but has declined or been lost from many of these in recent years. Major threats to remaining populations include drought, weed invasion, changed hydrology from tree plantations, grazing and disturbance from ploughing/cropping and road maintenance. *Lachnagrostis adamsonii* is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and as Threatened under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act). This is the first recovery plan for *L. adamsonii* and details its distribution, habitat, threats and recovery objectives and actions necessary to ensure its long-term survival.


## Species Information

### Description

Adamson's Blown-grass (*Lachnagrostis adamsonii*) (formerly known as *Agrostis adamsonii*) is a grass of the Family Poaceae growing to 70 cm in height and forms delicate, open inflorescences up to 25 cm in length that remain partly enclosed by the upper leaf sheath until late maturity, often drying to a pale golden colour. Leaves grow to 25 cm long and 3.5 mm wide but are often folded or inrolled. The light green or occasionally purple-tinged spikelets are 3–4 mm in length, the upper glume longer than the lower glume. Lemmas are awned from near the apex, the fine awn being straight or gently curved and 0.5–1.5 times the length of the lemma (description from Walsh & Entwistle 1994; Brown 2006).

There is variation amongst and between *L. adamsonii* populations, according to site characteristics and distribution. Plants found at drier sites are generally smaller with fewer inflorescences than those at moister sites, the latter being more robust. Plants growing in deeper water are often taller, developing adventitious roots and producing fewer inflorescences (Brown 1997). Populations from the west of its range have slightly hairy lemmas, populations in the east tend to have more glabrous lemmas, while populations from central regions of the range feature tall, robust plants with moderately hairy lemmas (A. Brown pers. comm.). Where its wetland habitat is ephemeral, *L. adamsonii* behaves as an annual, while at sites with moist conditions throughout the year, plants are perennial.

### Distribution

*Lachnagrostis adamsonii* is endemic to south-western Victoria, where it occurs across an area of about 15,000 km$^2$, from Clifton Springs near Geelong to near Coleraine (Walsh & Entwistle 1994) (Figure 1), in the Victorian Volcanic Plains and Victorian Midlands IBRA bioregion (*sensu* DEH 2000). Maps showing the distribution of *L. adamsonii* are available from the Department of Sustainability and Environment (DSE), Melbourne.

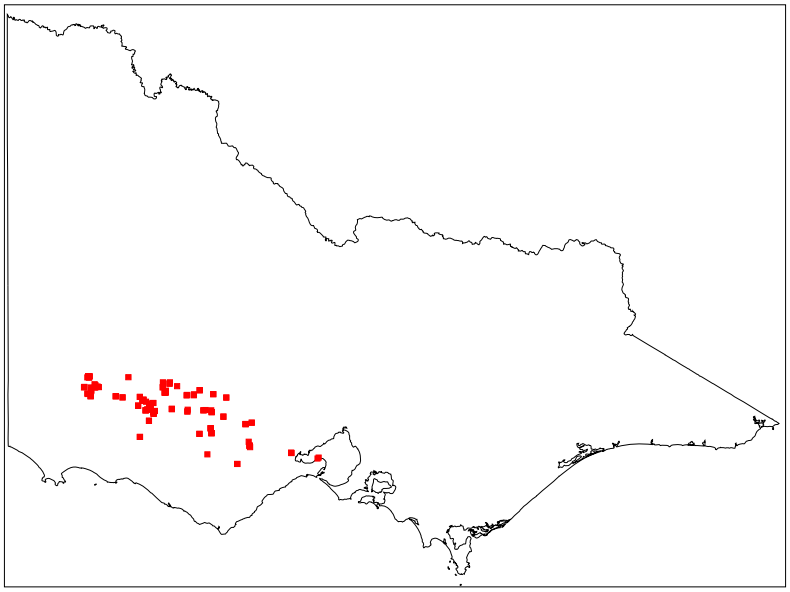

**Figure 1** Distribution of *Lachnagrostis adamsonii*

## Population Information

*Lachnagrostis adamsonii* was known from 68 locations, but with the decline and loss of the species at many locations over the last two decades (A. Brown DPI & Y. Ingeme DSE pers. comm.), the current number of populations is believed to be substantially fewer. Total number of plants is not known, but is estimated at <50,000. All populations occupy only small areas, often <1 ha.

Sixteen important populations have been identified (Table 1). This does not discount the importance of other known and unknown populations for future recovery actions. A reassessment of all remaining populations and determination of important populations is a proposed action in this recovery plan. Current important populations have been selected on the basis of the following criteria:

- representatives of the range of morphological variation found within the species;
- the site is located at the edge of its range;
- the biodiversity assets and/or site attributes enhance the chance for successful rehabilitation (i.e. they are large, intact or have surety of water supply);
- there is significant community support to maintain the population.

**Table 1** Important populations of *Lachnagrostis adamsonii*

| Location | Size | Extent | Mgr | Comments |
|---|---|---|---|---|
| Dashwood Station, off Eastern Access Lane, Mia Mia Ck Flats, Barunah | <2,500 plants | <1 ha | private | Landholder support for conservation |
| Cressy-Shelford Road - north side, Mia Mia Creek Flats, Barunah (roadside) | <2,500 plants | <1 ha | shire | |
| Delacombe Way, Willaura - both sides (private & roadside) | <1,000 plants | <1 ha | private/ shire | Relatively intact vegetation, 'Land for Wildlife' site |
| Hopkins River flats, off Delacombe Way, Willaura | <250 plants | <1 ha | private | Semi-permanent water, extensive, highly intact wetland, low level weed invasion |
| Ferrers Road - north side, Dereel (private & roadside) | <500 plants | <1 ha | private/ shire | |
| Streatham off Nerrin Nerrin Road | <1,000 plants | <1 ha | private | |
| Eurambeen - Streatham Road Marnocks Station (private & roadside) | <250 plants | <1 ha | private/ shire | Morphologically distinct population on extensive, highly intact wetland; further potential habitat available |
| Watgania Road - north side, Kio Ora (roadside) | <1,000 plants | <1 ha | shire | Relatively intact vegetation, good connectivity to associated waterways |
| Yalla-Y-Poora Road – west side Mininera East | >1,000 plants | <1 ha | private | Moderately intact vegetation |
| Williamsons Road, Reedy Creek Station, Wickliffe | <1,000 plants | <1 ha | private | Landholder support for conservation, good connectivity to associated waterways, relatively intact vegetation |
| Lismore-Skipton Road and Mailmans Track Skipton – (roadside & private) | >1,000 plants | <1 ha | private/ shire | Site of ongoing monitoring |
| Millers Road, Broken Creek flats – both sides, Skipton | <250 plants | <1 ha | private | Morphologically distinct population, relatively intact vegetation, good connectivity to associated waterways |
| Maroona – Glenthompson Road, Glenthompson | <1,000 plants | <1 ha | private | |
| Glenelg Hwy, Lake Bolac (private) | >250 plants | <1 ha | private | |
| Warners Road, Moorabool (roadside & private) | <500 plants | <1 ha | private/ shire | Largest population at eastern end of range; relatively intact vegetation; good connectivity to associated waterways |
| Barpinda-Winchelsea Road, Eurack (roadside & private) | <50 plants | <1 ha | private/ shire | Morphologically distinct population |

### Habitat

*Lachnagrostis adamsonii* occurs along slow moving creeks, depressions and drainage lines that are seasonally inundated or waterlogged and usually moderately to highly saline, growing on black, cracking clays or duplex soils with poorly permeable subsoils ranging from acidic (pH 4.6) to alkaline (pH 9.1) (Brown 1997). Plants appear to favour sites that have some shelter from the wind (often provided by other indigenous and exotic plants species). This preference for protected sites may explain why plants are rarely found around larger, more open, exposed saline lakes.

Dominant indigenous plant species occurring with *L. adamsonii* include (in order of frequency): Streaked Arrowgrass *(Triglochin striata),* Plains Saltmarsh-grass (*Puccinellia stricta* var. *perlaxa)*, Australian Salt-grass *(Distichlis distichophylla)*, Common Blown-grass (*Lachnagrostis filiformis)* and Beaded Glasswort *(Sarcocornia quinqueflora)* (FIS 2007). Other commonly found, saline habitat restricted species include Creeping Monkey-flower (*Mimulus repens)*, Salt Pratia (*Pratia platycalyx)*, Creeping Brookweed (*Samolus repens)*, Selleria (*Selleria radicans)* and Round-leaf (Wilsonia *Wilsonia) rotundifolia* (Brown 1997, 1998). Many exotic plant species have been recorded at *L. adamsonii* sites, including Water Buttons (*Cotula coronopifolia)*, Buck's-horn Plantain *(Plantago coronopus*, Annual Beard-grass *Polypogon monspeliensis*, Sea Barley-grass *Hordeum marinum*, Toowoomba), Canary-grass (*Phalaris aquatica)*, Tall Fescue (*Festuca arundinacea)*, Tall Wheat-grass (*Lophopyrum ponticum)* and Yorkshire Fog Grass (*Holcus lanatus)* (FIS 2007).

A proposed action in this recovery plan is to determine habitat that is critical to survival of *L. adamsonii.*

## Decline and Threats

Prior to 1987, only one specimen of *L. adamsonii*, collected in 1853 with a location of 'Melbourne', existed in herbarium records, at Kew Botanic Gardens, UK. The species was not seen again until its rediscovery near Glenthompson in south-western Victoria (Brown 1997). Extensive surveying during the 1990s led to the discovery of 68 populations and created a perception that *L. adamsonii* was relatively common within its restricted range. However, it is highly likely that, historically, many populations of *L. adamsonii* have been lost due to the extensive loss of native vegetation from the Victorian Volcanic Plains and Victorian Midlands bioregions, with <1% of the original extent of the grasslands and grassy woodlands remaining (Lunt *et al*. 1998). In addition, some of the populations discovered in the 1990s have declined substantially or been lost (A. Brown & Y. Ingeme pers. comm.). This decline is predominantly due to the effect of prolonged drought, which has led to altered water tables and a change in soil moisture and salinity levels. Recent changes to adjacent land use as well as the effect of climate change may continue to threaten the water supply for these wetlands in the future.

Remaining populations face a variety of current and potential threats (Moorrees 2004), including:

<u>Altered hydrology (including climate change)</u>
The wetlands in which *L. adamsonii* occurs have experienced a dramatic decrease in water availability in recent years. This is due to several influences, including the effect of drought conditions since 1994, the widespread establishment of Blue Gum (*Eucalyptus globulus)* plantations and the revegetation of saline sites using trees, shrubs and introduced grass species such as Tall Wheat-grass. As a result of these processes, the draw-down effect on the water table has led to a decrease in soil salinity levels at many sites and the conversion of saline environments to freshwater. As *L. adamsonii* does not appear to compete well with freshwater species, the original habitat of many *L. adamsonii* populations has been significantly depleted or lost. Tree planting and subsequent alteration of hydrology is a threat at the Lake Bolac site.

Dryland salinity affects more than 27,000 hectares in the Glenelg Hopkins catchment (GHCMA 2006). This has led many primary producers in the region to implement salinity control measures to mitigate its effects, including planting deep rooted perennial grasses, native trees and shrubs at the margins of wetlands and waterways. These works, in combination with ongoing dry conditions have led to a significant decline in the water table and a reduction in salinity at many secondary saline areas. Such activities, though beneficial in terms of economic outcomes, are detrimental to existing *L. adamsonii* populations.

Increased periods of drought pose a serious potential threat. Many populations may not be able to migrate to other suitable habitats. The ongoing dry/drought conditions highlighted the potential negative impact of climate change on these saline, ephemeral wetlands. Global climate change is likely to pose a serious threat in the future, with longer periods of low rainfall potentially leading to widespread extinctions of populations. Atmospheric research conducted by CSIRO suggests that

annual precipitation in the Glenelg Hopkins Catchment will probably decrease with changes in annual precipitation likely to vary from +10% to -25% by 2070 (DSE 2004). An increase in temperatures by 2070 of between 0.7°C to 4.3°C is also likely to cause a decline in surface water availability as a result of increased evaporation (DSE 2004). A loss of climatic habitat caused by anthropogenic emissions of greenhouse gases is listed as a Key Threatening Process under the EPBC Act.

Some *L. adamsonii* populations have been found in areas of secondary salinity, such as disturbed roadsides and rehabilitated erosion gullies. An example near Wickliffe illustrates how, with the exclusion of livestock, a large population can establish in an area previously subjected to severe erosion. This suggests that plants are able to migrate to new sites where conditions are suitable.

Weed invasion/competition

A number of exotic plants including several invasive weed species have been recorded at *L. adamsonii* sites. Salt tolerant species such as Tall Fescue and Tall Wheat-grass are more likely to pose a threat than other less tolerant species, as they are able to out-compete *L. adamsonii* in saline conditions. In particular, Tall Wheat-grass has proven to be highly competitive, and continuing invasion by this species is likely to lead to the extinction of *L. adamsonii* at a large number of sites.

Other salt tolerant species including Spiny Sharp Rush (*Juncus acutus* subsp. *Acutus)* and Common Reed (*Phragmites australis)* may also pose a threat through competition. Weed invasion by less salt tolerant species can also threaten *L. adamsonii* populations. Lowering the water table followed by flushing of surface soil layers has been observed to reduce soil and water salinity levels, enabling a new suite of species to invade *L. adamsonii* populations (A. Brown and Y. Ingeme pers. comm.). Sites experiencing altered hydrology are now threatened by weeds such as Yorkshire Fog Grass (*Holcus lanatus).* Weed invasion is deemed to be a threat at the Lismore-Skipton Road/Mailmans Track, Delacombe Way Willaura, Cressy-Shelford Road, Mia Mia Creek, Ferrers Road, Dereel, Barpinda-Winchelsea Road, Maroona-Glenthompson Road, Glenthompson and Eurack populations.

Disturbance/destruction of plants and habitat

Disturbance to and destruction of habitat and plants is a major threat to *L. adamsonii*. Many populations on roadsides are at risk from road and utilities management works, and substantial road works have been undertaken at the site of the Eurambeen-Streatham Road, St. Marnocks Station population. Increased awareness of the locations of populations is required by shires and road authorities in order to avoid such impacts. How the hydrology will respond to a return to normal seasonal conditions following the drought is not known. Populations on private land are at risk from changed land use such as grazing to cropping, and cropping is a potential threat at the Warners Road, Moorabool and Millars Road, Skipton populations. Stock movement and soil pugging is a problem at the Maroona - Glenthompson Road, Glenthompson population.

At least two sites are subject to soil erosion. Overgrazing and scalding by salinity can cause erosion which can lead to vegetation loss and increased stream sedimentation. Ironically, it is in these environments which are devoid of competing vegetation and where salinity levels remain high that *L. adamsonii* has managed to thrive. This illustrates the potential uses of this species in soil remediation works rather than introducing non-indigenous species that may pose additional ecological problems.

Grazing

Although *L. adamsonii* may tolerate the effects of light grazing (Grove 1997) it is unlikely that populations can withstand heavy grazing (A. Brown pers. comm.). Although grazing is not a threat at most sites, losses have occurred at some sites where heavy grazing has taken place. Depending on the species present, the removal of grazing may also lead to a proliferation of weed species that threaten *L. adamsonii* (Y Ingeme pers. comm.). Overgrazing has led to significant impacts at some populations and remains a significant threat at all sites accessible to stock. However, where grazing may also control weeds, the exclusion of grazing may lead to increased competition from exotic species in some cases. Grazing is a potential problem at the Nerrin Nerrin Road, Streatham and Yalla-Y-Poora Road, Mininera East, Delacombe Way, Willaura, Cressy-Shelford Road, Mia Mia Creek, Ferrers Road, Dereel and Barpinda-Winchelsea Road, Eurack populations.

# Recovery Information

## Current Conservation Measures

A number of measures for the conservation of *L. adamsonii* have been undertaken, including:

- Survey of potential habitat during the 1990s to determine distribution and abundance.
- Establishment of long-term monitoring transects at three sites (Brown 2001).
- Research projects by third year students from Ballarat University on the effect of trimming and varying salt concentrations on growth and germination of *L. adamsonii* (Lardner 1995; Viljoen 1995; Lynch 1996; Grove1997).
- Compilation of a pamphlet on *L. adamsonii* conservation for community groups and land managers.
- Morphometric and genetic analysis of six *L. adamsonii* populations (James & Brown 2000).
- Fencing of the Van Renens Road (Glenthompson) site to prevent grazing by stock.
- Signposting at some roadside sites.

## Recovery Objectives

The overall objective of recovery is to minimise the probability of extinction of *Lachnagrostis adamsonii* in the wild and to increase the probability of populations becoming self-sustaining in the long term. Within the five-year duration of this Recovery Plan, the specific objectives for the recovery of *Lachnagrostis adamsonii* are to:

1. Determine taxonomy, distribution, abundance and population structure
2. Determine habitat requirements
3. Ensure that all populations and their habitat are protected and managed
4. Identify and manage threats to populations
5. Identify key biological functions
6. Determine growth rates and viability of populations
7. Establish a seed bank
8. Build community and government support for conservation

## Program Implementation and Evaluation

This Recovery Plan guides recovery actions for *Lachnagrostis adamsonii* and will be implemented and managed by the Department of Sustainability and Environment, supported by other agencies, educational institutions, regional natural resource management authorities and community groups as appropriate. Technical, scientific, habitat management or education components of the Recovery Plan will be referred to specialist groups on research, *in situ* management, community education and cultivation as required. The Recovery Plan will run for a maximum of five years from the date of its adoption under the EPBC Act, and will be reviewed and revised within five years of its adoption.

## Recovery Actions and Performance Criteria

| Action | Description | Performance Criteria |
|---|---|---|
| **Specific Objective 1: Determine taxonomy, distribution, abundance and population structure** | | |
| **1.1** | Undertake surveys to determine area & extent of populations, number, size & structure of populations, and inference or estimation of population change.<br>**Responsibility: DSE** | • 20 population sites mapped for population size, condition and habitat. |
| **Specific Objective 2: Determine habitat requirements** | | |
| **2.1** | Survey known habitat and collect floristic &environmental information relevant to community ecology and condition.<br>**Responsibility: DSE** | • Species/habitat specific survey design prepared.<br>• Habitat critical to survival mapped for 20 pops. |
| **2.2** | Identify and survey potential habitat, using ecological & bioclimatic information to indicate habitat preference.<br>**Responsibility: DSE** | • Potential habitat at 5 new sites surveyed.<br>• Predictive model for potential habitat developed & tested at 5 sites. |
| **Specific Objective 3: Ensure that all populations and their habitat are protected and managed appropriately** | | |
| **3.1** | Protect populations on public land.<br>**Responsibility: DSE** | • Public Authority Management Agreements in place for 5 roadside pops.<br>• 'Significant Roadside Site' signage in place for all important roadside pops. |
| **3.2** | Protect populations on private land.<br>**Responsibility: DSE, CMA, local govt** | • Conservation agreements negotiated with landowners for protection of 5 populations.<br>• Major sites included as Environmental Significance Overlay (ESO) on Sites of Biodiversity Mapping in Shire Planning Schemes. |
| **Specific Objective 4: Identify and manage threats to populations** | | |
| **4.1** | Control threats from pest plants.<br>**Responsibility: DSE** | • Reduction in cover of weeds at 10 sites. |
| **4.2** | Control threats from stock/pest animal grazing.<br>**Responsibility: DSE** | • Reduction in grazing pressure at 10 sites.<br>• Measurable seedling recruitment in populations. |
| **4.3** | Control the threat of direct damage by human activities.<br>**Responsibility: DSE** | • Signposting of all roadside sites (and fencing if required) undertaken. |
| **4.4** | Investigate and assess other threats.<br>**Responsibility: DSE** | • Threat assessments undertaken for 10 populations. |
| **Specific Objective 5: Identify key biological functions** | | |
| **5.1** | Evaluate current reproductive status, seed bank status, longevity, fecundity & recruitment levels.<br>**Responsibility: DSE** | • Reproductive ecology and regenerative potential quantified for 5 representative sites.<br>• Seed bank potential quantified for 5 representative sites. |
| **5.2** | Identify key stimuli for seed germination requirements.<br>**Responsibility: DSE** | • Stimuli for recruitment identified.<br>• Information included in conservation management strategies. |
| **Specific Objective 6: Determine the growth rates and viability of populations** | | |
| **6.1** | Measure population trends & responses against recovery actions by collecting demographic information including recruitment, mortality and life history stages.<br>**Responsibility: DSE** | • Techniques for monitoring developed and implemented.<br>• Population growth rates determined and Population Viability Analysis completed for all populations. |
| **Specific Objective 7: Establish a seed bank** | | |
| **7.1** | Establish a seed bank and determine seed viability.<br>**Responsibility: RBG** | • Seed from 10 populations in storage. |
| **Specific Objective 8: Build community and government support for conservation** | | |
| **8.1** | Promote awareness and conservation of *L. adamsonii* to local communities and government.<br>**Responsibility: DSE, CMA** | Landcare groups aware of species and actively participate in activities for its conservation. |

**Abbreviations:** DSE – Department of Sustainability and Environment (Victoria); RBG – Royal Botanic Gardens, Melbourne; CMA – Catchment Management Authorities (Vic)

# Management Practices

The philosophy of the strategy for recovery is habitat conservation, restoration and management combined with an understanding of the ecological and biological requirements of *L. adamsonii* necessary for specific population management. The emphasis is on using knowledge to better implement *in situ* management techniques that protect populations and promote regeneration and recruitment. To achieve this, recovery actions are structured to acquire baseline data, assess habitat condition, including ecological and biological function, and maintain or improve population growth through protection and management.

On-ground site management will aim to mitigate threatening processes and thereby insure against extinction. Broad scale protection measures include legal protection of sites, habitat retention and liaison with land managers and private landholders. In addition, searches of known and potential habitat should continue to better define the distributions and size of populations, particularly in respect to known short-term climate cycles and potential long-term climate change. Extension activities to raise the awareness of landholders and managers of the ecology of saline wetland communities and the threatening processes that act upon them is required.

The recovery plan also advocates strategies to improve our understanding of seed bank dynamics and recruitment, much of which has been completed. Successful *in situ* population management will be founded on understanding the obligate relationships between *L. adamsonii* and associated flora, as well as its response to environmental processes. These are directly linked to seed production, recruitment and regeneration and are thus vital to recovery. Demographic censusing will be necessary to gather life history information and to monitor the success of particular management actions. Revised monitoring protocols (Miller 1996) will enable data collected to be statistically rigorous and representative of widespread population trends. Community participation in recovery actions will be sought, particularly in regard to implementation of on-ground works.

## Affected Interests

*Lachnagrostis adamsonii* populations occur on both public and private land with a high number of these located on roadsides. Only one population occurs within a crown reserve. Roadside sites fall under the management responsibility of either Shire councils or VicRoads. The remaining populations occur on private land. All efforts will be made to ensure ongoing liaison and negotiation with these parties with respect to site management. Options to maintain and enhance *L. adamsonii* populations have been developed in a manner so as to minimise socio-economic impacts on landholders. Opportunities exist to rehabilitate secondary saline areas with *L. adamsonii* and other associated indigenous flora. Subsequently, the recovery of *L. adamsonii* may lead to beneficial outcomes for affected land mangers.

## Role and Interests of Indigenous People

Indigenous communities on whose traditional lands *L. adamsonii* occurs have been advised, through the relevant regional Indigenous facilitator, of the preparation of this Recovery Plan and invited to provide comments and be involved in the implementation of the plan.

## Biodiversity Benefits

*Lachnagrostis adamsonii* grows within the 'Natural Temperate Grassland of the Victorian Volcanic Plain', a threatened ecological community listed as Critically Endangered under the EPBC Act. Conservation efforts arising from the implementation of this recovery plan are likely to benefit this threatened community including other co-occurring species listed as threatened under the EPBC Act such as Salt-lake Tussock-grass *Poa sallacustris.*

## Social and Economic Impacts

Recovery of *L. adamsonii* will be achieved through the objectives outlined in this document. These objectives aim to raise awareness among rural landholders and create opportunities to incorporate *L. adamsonii* and other associated wetland species in existing revegetation works. This will be achived through negotiation and voluntary agreements with landholders, supported by incentives where possible. As such, the implementation of this recovery plan is unlikely to cause significant adverse social and economic impacts.

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## Priority, Feasibility and Estimated Costs of Recovery Actions

| *Action* | *Description* | *Priority* | *Feasibility* | *Responsibility* | *Cost estimate* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Total |
| **1** | **Distribution, abundance** | | | | | | | | | |
| 1.1 | Surveys | 1 | 100% | DSE | $10,000 | $10,000 | $10,000 | $8,000 | $8,000 | $46,000 |
| **2** | **Habitat requirements** | | | | | | | | | |
| 2.1 | Known habitat | 1 | 100% | DSE | $20,000 | $20,000 | $20,000 | $0 | $0 | $60,000 |
| 2.2 | Potential habitat | 2 | 75% | DSE | $0 | $0 | $20,000 | $20,000 | $20,000 | $60,000 |
| **3** | **Habitat protection** | | | | | | | | | |
| 3.1 | Public land | 1 | 100% | DSE | $8,000 | $8,000 | $0 | $0 | $0 | $16,000 |
| 3.2 | Private land | 1 | 75% | DSE, CMA | $5,000 | $5,000 | $5,000 | $5,000 | $5,000 | $25,000 |
| **4** | **Threat management** | | | | | | | | | |
| 4.1 | Pest plants | 1 | 75% | DSE | $15,000 | $15,000 | $10,000 | $10,000 | $10,000 | $60,000 |
| 4.2 | Grazing, pest animals | 1 | 75% | DSE | $20,000 | $15,000 | $10,000 | $10,000 | $10,000 | $65,000 |
| 4.3 | Human damage | 1 | 75% | DSE | $15,000 | $15,000 | $10,000 | $10,000 | $10,000 | $60,000 |
| 4.4 | Other threats | 2 | 50% | DSE | $0 | $10,000 | $10,000 | $8,000 | $0 | $28,000 |
| **5** | **Biological functions** | | | | | | | | | |
| 5.1 | Reproductive status | 2 | 75% | DSE | $0 | $10,000 | $10,000 | $10,000 | $5,000 | $35,000 |
| 5.2 | Seed germination | 2 | 75% | DSE | $0 | $0 | $0 | $10,000 | $5,000 | $15,000 |
| **6** | **Population viability** | | | | | | | | | |
| 6.1 | Censusing | 1 | 100% | DSE | $15,000 | $15,000 | $15,000 | $15,000 | $15,000 | $75,000 |
| **7** | **Seed bank** | | | | | | | | | |
| 7.2 | Seed bank | 3 | 100% | RBG | $0 | $0 | $5,000 | $2,000 | $2,000 | $9,000 |
| **8** | **Community support** | | | | | | | | | |
| 8.1 | Community extension | 3 | 50% | DSE, CMA | $2,000 | $2,000 | $2,000 | $2,000 | $2,000 | $10,000 |
| | | | | **TOTALS** | $110,000 | $125,000 | $127,000 | $110,000 | $92,000 | $564,000 |